

Attorney Docket #: N1085-00018(TSMC2002-0629)

Application Serial No.: 10/730,533

TC/AU No.: 1756

Amendment dated March 8, 2007

Amendments to the Claims:

The claims in this listing will replace all prior claims in the application.

Listing of Claims:

1. (Currently Amended) A mask comprising:
a mask substrate; and
at least one annular equal line space phase shifting pattern on said mask substrate to produce [[a]] ~~substantially an~~ unexposed region on a semiconductor substrate, the at least one annular equal line space phase shifting pattern including:
an annular ring, and
a central portion, wherein a mask pitch of said at least one annular equal line space phase shifting pattern is smaller than two times of a corresponding critical dimension pitch on said semiconductor substrate.
2. (Canceled)
3. (Previously Presented) The mask of claim 1, wherein said annular ring has a phase shift of approximately 180 degrees from that of said mask substrate and said central portion.
4. (Previously Presented) The mask of claim 1, wherein said at least one annular equal line space phase shifting pattern further comprises a plurality of annular rings.
5. (Previously Presented) The mask of claim 4, wherein an outermost annular ring has a phase shift of approximately 180 degrees from that of said mask substrate and an adjacent inner annular ring, each inner annular ring having a phase shift of approximately 180 degrees from that of its outer adjacent annular ring, and said central portion having a phase shift of approximately 180 degrees from that of an innermost ring.
6. (Original) The mask of claim 1, wherein said mask substrate comprises quartz.

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7. (Previously Presented) The mask of claim 1, wherein said at least one annular equal line space phase shifting pattern is substantially transparent to an incident radiation for photomasking.
8. (Canceled)
9. (Currently Amended) A method of manufacturing a mask, comprising:
providing a mask substrate;
forming a layer of resist material over said mask substrate;
patterning said resist layer;
patterning at least one annular equal line space phase shifting pattern on said mask substrate, the at least one annular equal line space phase shifting pattern including an annular ring and a central portion, wherein a mask pitch of said at least one annular equal line space phase shifting pattern [[being]] is smaller than two times of a corresponding critical dimension pitch on said a semiconductor substrate; and
removing a remaining portion of said resist layer.
10. (Currently Amended) A method of manufacturing a mask, comprising:
providing a mask substrate;
forming a layer of conductive material over said mask substrate;
forming a layer of resist material over said conductive layer;
patterning said resist layer;
patterning said conductive layer;
removing a remaining portion of said resist layer;
patterning onto said mask substrate at least one annular equal line space phase shifting pattern including an annular ring and a central portion, wherein a mask pitch of said at least one annular equal line space phase shifting pattern [[being]] is smaller than two times of a corresponding critical dimension pitch on said a semiconductor substrate; and

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removing a remaining portion of said conductive layer.

11. (Original) The method of claim 10, wherein said mask substrate comprises quartz.
12. (Original) The method of claim 10, wherein said layer of conductive material comprises chrome.
13. (Previously Presented) The method of claim 10, wherein said at least one annular equal line space phase shifting pattern comprises an annular ring and a central portion.
14. (Previously Presented) The method of claim 10, wherein said at least one annular equal line space phase shifting pattern comprises a plurality of annular rings and a central portion.
15. (Previously Presented) The method of claim 10, wherein said at least one annular equal line space phase shifting pattern is formed on said mask substrate by etching said mask substrate.
16. (Currently Amended) The method of claim 10, wherein said at least one annular equal line space phase shifting pattern is formed on said mask substrate by disposing phase shifting material on said mask substrate.
- 17-22. (Cancelled)